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Examining Individual and Instruction-Related Predictors of the Self-Determination of Students With Disabilities: Multiple Regression Analyses

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Abstract

This study examined individual and instructional predictors of the self-determination of students with disabilities, as measured by the *Arc's Self-Determination Scale* and the student version of the *AIR Self-Determination Scale*. The general findings indicated that instructional, knowledge, and dispositional factors were stronger predictors of students' self-determination than personal predictor variables. In particular, self-efficacy and outcome expectancy scores, student-directed transition planning instruction, and students' preintervention transition planning knowledge were predictive of higher self-determination scores among students.

Keywords

self-determination, self-efficacy, transition planning, predictors

Promoting the self-determination of youth with disabilities has become best practice in secondary and transition services, in part because research confirms that self-determination is related to more positive academic (Konrad, Fowler, Walker, Test, & Wood, 2007; S. H. Lee, Wehmeyer, Soukup, & Palmer, 2010) or adult outcomes, including employment and independent living (Martorell, Gutierrez-Recacha, Pereda, & Ayuso-Mateos, 2008; Wehmeyer & Palmer, 2003; Wehmeyer & Schwartz, 1997) and more positive quality of life and life satisfaction (Lachapelle et al., 2005; McDougall, Evans, & Baldwin, 2010; Miller & Chan, 2008; Nota, Ferrari, Soresi, & Wehmeyer, 2007; Shogren, Lopez, Wehmeyer, Little, & Pressgrove, 2006; Wehmeyer & Schwartz, 1998). To enable students with disabilities to be more self-sufficient and better able to manage their own lives, promoting self-determination skills must become a critical part of transition services (Wehmeyer, Abery, Mithaug, & Stancliffe, 2003).

Factors Contributing to Self-Determination of Transition-Aged Students With Disabilities

The functional theory of self-determination forwarded by Wehmeyer and colleagues (Wehmeyer, 1999; Wehmeyer et al., 2003) suggests that individual *capacity*, as influenced by learning and development, *opportunity*, as influenced by environments and experiences, and *supports and accommodations* affect the emergence and development of self-determination. In other words, the development of self-determination is influenced by both personal characteristics (e.g., age, level of cognitive ability, temperament) and external factors, including environment, opportunities, and instructional experiences.

Instructional factors. Several studies have determined the efficacy of curricula and instructional models to promote self-determination (Test, Karvonen, Wood, Browder, & Algozzine, 2000; Wehmeyer et al., 2003; Zhang, 2001). In a meta-analysis of single-subject and group-design studies, Algozzine, Browder, Karvonen, Test, and Wood (2001) found evidence for the efficacy of instruction to promote component elements of self-determined behavior, including interventions to promote self-advocacy, goal setting and attainment, self-awareness, problem-solving skills, and

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decision-making skills. Similarly, Cobb, Lehmann, Newman-Gonchar, and Alwell (2009) identified seven existing meta-analyses examining self-determination and concluded that sufficient evidence exists to support the promotion of self-determination as effective. Besides studies examining the promotion of self-determined behavior, research documents the efficacy of efforts to promote student involvement in educational and transition planning (Martin et al., 2006; Mason, Field, & Swailowsky, 2004; Test et al., 2004) on more positive transition and self-determination outcomes.

Intraindividual and environmental factors. Multiple studies have shown that individual and environmental factors affect a person's relative self-determination (Nota et al., 2007; Shogren et al., 2006; Wehmeyer, & Bolding, 1999, 2001). For example, Wehmeyer and Bolding (1999) found that people living or working in community-based, noncongregate settings were more self-determined and autonomous, had more choice opportunities, and were more satisfied than were IQ- and age-matched peers living or working in community-based congregate settings or non-community-based congregate setting. Stancliffe, Abery, and Smith (2000) found that self-determination and choice opportunities improved for people who moved out of an institution when compared with peers who did not.

With regard to personal characteristics, research shows a positive relationship between self-determination and IQ scores (Stancliffe et al., 2000), though Wehmeyer and Garner (2003) determined that IQ was not a significant predictor of self-determination status using regression analysis, whereas choice availability was the primary predictor. Research examining differences in self-determination by gender has been limited and the findings are mixed. Wehmeyer and Garner found no differences on overall self-determination scores by gender for people with disabilities. Nota et al. (2007) and Shogren et al. (2007), however, found that gender significantly affected self-determination. These findings differed, however, in that Nota and colleagues, with an Italian sample, found that males had higher self-determination scores and Shogren and colleagues, with an American sample, identified females as having higher self-determination scores.

Purpose of Study

There are several reasons that understanding intraindividual, instructional, and contextual variables related to self-determination is important. First, such research serves as a means to establish construct validity for the self-determination construct itself (e.g., by testing hypotheses about these variables derived from theoretical perspectives) and, similarly, serves to evaluate the utility of various theoretical models of self-determination. A primary requirement of theories of any kind involves their capacity to predict the future occurrence of the behavior, characteristic, or action. Thus, research on such variables provides a means to evaluate current theoretical models. Second, knowledge about the relationship between intraindividual and external variables and self-determination can provide important information for the design of interventions. As research establishes the relative contributions of these variables, practitioners can determine how to address these in the context of interventions. Third, such information can lead to systemic change. For example, knowledge that congregate settings inherently restrict self-determination has been used to argue for more inclusive work and residential opportunities for people with intellectual and developmental disabilities (Wehmeyer & Bolding, 1999, 2001; Wehmeyer & Garner, 2003).

Although a literature base pertaining to the intraindividual factors related to student self-determination is emerging, there is a need to both replicate and expand this research. Particularly, although most theories of self-determination frame the construct in terms of personality and social development of adolescents, the only studies on intraindividual factors have been with high-school-age students, and studies need to be conducted that expand that to younger students so as to get a better sense of the trajectory of the development of these intraindividual factors and self-determination. Second, the extant literature base in this area has, by and large, examined these factors separate from instructional and experiential factors, and given that the development of self-determination involves both intraindividual and contextual factors, a need exists for research beginning to look at the contributions of each of these. Finally, this literature base has not directly examined the contribution of these intraindividual factors to student transition-related knowledge and skills. This study addresses these gaps in the literature by examining the contribution of intraindividual and external factors, including experiential and instructional factors and knowledge about transition, to the self-determination of middle and junior high school students. The study also examined the contribution of these same factors to transition knowledge and skills for this group. Specifically, the research examined the following research question:

> What intraindividual (age, gender, and IQ group), dispositional (self-efficacy and outcome expectancy for transition planning), experiential and instructional (student-directed transition planning instruction, computer-based reading support program), and knowledge (understanding transition planning) factors best predict postintervention self-determination and transition knowledge?

Method

Study Participants

Study participants were 168 junior high and middle school students receiving special education services identified by

Table 1. Demographic Description of Participating Students

	n	%
Gender		
Female	44	26.2
Male	124	73.8
Age		
M	13.60	
SD	0.84	
Disability		
ADD or ADHD	14	8.3
ED or BD	18	10.7
MR	23	13.7
Speech	15	8.9
OHI	13	7.7
Autism	7	4.2
LD	78	46.4
IQ level		
IQ within normal limit (70 or more)	137	81.5
Mild MR (60–69)	19	11.3
Moderate MR (45–60)	10	6.0
Severe or profound (44 or less)	2	1.2
Receiving technology support		
Yes	86	51.2
No	82	48.8

ADD = attention deficit disorder; ADHD = attention-deficit/hyperactivity disorder; ED = emotional disorders; BD = behavioral disorders; MR = mental retardation; speech = speech disorder; OHI = other health impairment; LD = learning disability.

educators as requiring supports with regard to reading. The characteristics of participating students are provided in detail in Table 1. These students were recruited from 12 campuses at six school districts in the Midwestern United States. District-level administrators in special education for districts located within range of the research site were contacted in relation to their interest in participating. For districts that responded affirmatively, appropriate consent was obtained at the district level, after which the administrative contact person identified special education teachers at middle or junior high school campuses. Those teachers were invited to a 1-hour introduction to the project and training on the *Whose Future Is It Anyway?* (WFA) curriculum (the WFA is available freely online, so participating teachers benefited from training whether they consented to be involved in the project or not). At the end of the training, they were given consent forms to sign if they agreed to participate and, if so, were provided student consent forms to send to parents or guardians of students for whom they had instructional responsibilities who met the study criteria: (a) junior high and middle school student (b) receiving special education services (e.g., intellectual disability, learning disability) who had reading difficulties.

Procedures

All participants in this study received instruction using a student self-regulated transition planning process titled *Whose Future Is It Anyway?* (Wehmeyer et al., 2004). Approximately half (n = 46) of the students received instruction on the curriculum using a digital form delivered on a cognitively accessible e-reader (*Rocket Reader*). The other half (n = 82) received instruction using the hard copy versions of the curriculum. Assignment to technology or traditional groups was by random assignment by campus level after the receipt of informed consent from teachers. Teachers working with students in the technology group were then provided additional training about using *Rocket Reader.* Table 2 provides descriptive information for participants receiving the intervention with and without the technology support. An evaluation of the effect of the intervention as a function of the use of technology on self-determination, self-efficacy and outcome expectancy, and transition knowledge has been reported in Y. Lee et al. (in press). This current study examines the relationships among intraindividual, instructional, and contextual variables on self-determination for the group as a whole.

All teachers were trained on the use of the assessments and, following baseline data collection, were asked to implement instruction for 10 weeks and received weekly support from the researchers via email contacts. Baseline and postintervention data collection was conducted using multiple measures of self-determination, self-efficacy and outcome expectancy for educational planning, and knowledge of transition planning, all described subsequently, and teachers were asked to fill out a demographic information form for each student. Because we were interested in examining intraindividual factors along with instructional and contextual factors, only postintervention data were analyzed for this report.

The full WFA curriculum was designed to be implemented across an academic year. Both because of the length of time available for intervention and because the intervention was to be implemented with younger students, the lead author selected 10 lessons, about one-third of the total program, that were most appropriate for middle or junior high school students. These lessons covered student preferences and interests, disability awareness, student unique learning needs, supports, communicating in small groups, body language and assertiveness, advocating for oneself, self-regulated problem solving, identifying goals, and being an effective team member.

Instrumentation and Data Collection

Measuring self-determination. The *Arc's Self-Determination Scale* (SDS; Wehmeyer & Kelchner, 1995) and the *AIR Self-Determination Scale–Student Form* (AIR; Wolman,

Table 2. Descriptive Information of Intervention Groups

Intervention groups	Technology group	Non–technology group
N	86 students	82 students
Average age	13.89 (*SD* = 0.78)	13.29 (*SD* = 0.78)
Gender	20 females, 66 males	24 females, 58 males
IQ groups	58 within normal limit (70 or more), 18 mild MR, 8 moderate MR, and 2 severe or profound MR	79 IQ within normal limit (70 or more), 1 mild MR, and 2 moderate MR
N (teachers)	14 teachers	11 teachers
Average age	44.08 (*SD* = 6.54)	41.10 (*SD* = 9.41)
# of teaching years	14.43 (*SD* = 8.99)	16.09 (*SD* = 5.94)
Received instructions and material	Student-directed transition planning instruction using the *Whose Future Is It Anyway?* lessons	Student-directed transition planning instruction using the *Whose Future Is It Anyway?* lessons
	Student's book, teacher's notebook	Student's book, teacher's notebook
	Rocket Reader, a computer-based reading support	
	Rocket Reader software	
	Whose Future Is It Anyway? tech binder (student's and teacher's)	

MR = mental retardation.

Campeau, DuBois, Mithaug, & Stolarski, 1994) were used to measure self-determination. The SDS is a student self-report measure of global self-determination consisting of a 72-item self-report scale that provides data on overall self-determination by measuring individual performance in the four *essential characteristics* (i.e., autonomy, self-regulation, psychological empowerment, and self-realization) of self-determination identified by Wehmeyer, Kelchner, and Richards (1996). On the scale, 148 points are available, and higher scores reflect higher levels of self-determination. The SDS was normed with 500 students with and without cognitive disabilities in rural, urban, and suburban school districts in five states (Wehmeyer et al., 1996). The scale's concurrent criterion-related validity was established by showing relationships between SDS and conceptually related measures. The SDS had adequate construct validity, including factorial validity established by repeated factor analyses and discriminative validity and internal consistency (Cronbach's $\alpha = .90$; Wehmeyer, 1996). The SDS has been used to document the importance of self-determination for positive outcomes (Wehmeyer & Palmer, 2003; Wehmeyer & Schwartz, 1998) and student involvement in educational planning for youth with disabilities (Cross, Cooke, Wood, & Test, 1999; Sands, Spencer, Gliner, & Swaim, 1999; Zhang, 2001) and has provided validation of interventions to promote self-determination (Wehmeyer et al., 2003).

The AIR (Wolman et al., 1994) examines individual capacity for and opportunity to practice self-determination. The AIR has three Capacity sections, including Ability, Knowledge, and Perceptions, and two Opportunity sections, including Opportunity at School and Opportunity at Home. Within each section are two items that focus on Thinking, two that focus on Doing, and two that focus on Adjusting. Specifically, the AIR Student form (AIR-S) was used to measure self-determination in this study. The AIR-S has 24 questions and yields Capacity and Opportunity subscale scores. The Capacity subscale consists of questions pertaining to things students do related to self-determination (Things I Do subscale) and how students feel about performing these self-determined behaviors (How I Feel subscale). The Opportunity subscale has questions regarding students' perceptions of opportunities to perform self-determined behaviors at home and at school, on a scale of 1 (*never*) to 5 (*always*). Total score of the AIR-S was used in this study.

The AIR was developed and normed with 450 students with and without disabilities in California and New York (Wolman et al., 1994). The AIR was demonstrated to have adequate reliability and validity in the measurement of capacity and opportunity for self-determination (Mithaug, Campeau, & Wolman, 2003). Reliability was determined using alternative-item correlations, split-half reliability tests, and test–retest measures of stability. For alternative-item tests, correlations ranged from .91 to .98; split-half analysis yielded a reliability of .95; and test–retest analyses over 3 months yielded a correlation of .74. Factor analysis of the items yielded results that were consistent with the conceptual structure of the scale for both the Opportunity and Capacity sections. Recent research (Shogren et al., 2008) has confirmed the theoretical structure of the AIR (i.e., two related subscales—Capacity and Opportunity—that contribute to a higher order self-determination construct). This research also confirmed that although the SDS and the AIR-S are related ($r = .50$), they are measuring distinct aspects of the self-determination construct. Shogren et al. found that combining these two measures into one

global, higher order self-determination construct was not justified by data.

Measuring transition planning knowledge. To measure transition planning knowledge, the WFA *Knowledge Test* (Wehmeyer & Lawrence, 1995), a criterion-referenced assessment of knowledge presented in the WFA process, was administered before and after instruction. The assessment contains a total of 28 questions, with students asked to select one best answer from four possible answer options for each question. Questions were taken directly from lessons in the WFA process. Students are awarded one point if they select the correct answer and no points if they do not. For the purpose of the study, only questions pertaining to the lessons implemented were included, resulting in 20 items.

Measuring self-efficacy for educational planning. Self-efficacy refers to the "conviction that one can successfully execute the behavior required to produce a given outcome" (Bandura, 1977, p. 193), and outcome expectations refer to a person's belief that if a specific behavior is performed it will lead to the anticipated outcome. To measure the degree to which students believed (a) that they could perform the behaviors they needed to successfully participate in their transition planning meeting and (b) that if they did perform these behaviors, the desired outcome would result (e.g., they would be allowed to participate in the meeting), students completed a 20-item questionnaire constructed by Wehmeyer and Lawrence (1995). The first 10 items on the questionnaire ask students about their beliefs in their ability to participate in an individualized education program (IEP) meeting (purpose of IEP meeting, knowledge of rights, roles of IEP team members, how to communicate preferences, etc.). The second set of 10 questions focuses on anticipated outcomes (e.g., "If you participate in your IEP meeting, will that affect the transition goals chosen? If you speak up, will your rights at the IEP meeting be respected?"). Wehmeyer and Lawrence (1995) found that the questionnaire scores were positively and significantly correlated ($r = .36$, $p = .008$) with a widely used measure of self-efficacy, the *Self-Efficacy Scale* (Sherer et al., 1982). Cronbach's alpha for the Self-Efficacy portion of the measure for this study was .816, whereas alpha for the Outcome Expectancy section was .849.

Demographic Information

All teachers participating in this study were asked to complete a demographic information form that included basic information about each student, such as date of birth, gender, race/ethnicity, and disability category under which the student received special education services. This form also included questions pertaining to the student's typical educational setting, inclusion level, estimated level of intelligence, reading level, computer use skills, and classroom learning behaviors. Teachers were asked to provide information about how many hours each day the student typically spent with his or her nondisabled peers.

Data Analysis

A power analysis was conducted to examine how many participants would be needed under multiple regression analysis to achieve a power of .80. Based on previous research with the WFA (Wehmeyer & Lawrence, 1995), the effect size (Lipsey & Wilson, 2001) of intervening with the WFA was estimated as measured by (a) the WFA *Knowledge Test* (Cohen's $d = .43$), (b) the *Self-Efficacy Assessment* (Cohen's $d = .50$), and (c) the *Outcome Expectancy Assessment* (Cohen's $d = .36$). These effect sizes indicate that the WFA has a small to moderate impact (WFA *Knowledge Test* and *Outcome Expectancy*) or a moderate impact (*Self-Efficacy*). As a result of these individual analyses, a value of .40 (Cohen's *d*) was selected for use in the power analysis to ensure that adequate power would be achieved. Using formulas specified by Cohen (1988) and the fpower macro (Friendly, 1983), the power was calculated. Factoring in the fact that eight indicators would be used in the model (see Table 3), the total number of participants without the consideration of any grouping was calculated, and 100 participants was estimated as being required.

Missing data. There was a small amount of missing data on several variables. The mean percentage of missing data across the variables in the data set was 0.60% (range = 0%–1%). The EM imputation algorithm using the Missing Value Analysis procedure within SPSS was used to impute the missing data (Acock, 2005), to preserve important characteristics of our data set and avoid the deleterious effects of not including all available data in the analysis process.

Analytical procedures. To investigate which variables best predicted students' self-determination, multiple regression analyses were conducted. The general purpose of multiple regression is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable (Tabachnick & Fidell, 2001). As articulated in the research question, with self-determination as the dependent variable and eight personal, instructional, knowledge, and dispositional variables as predictor variables, standard multiple regression analyses were performed. The dependent variable was a self-determination score, and the predictors were the eight intraindividual, instructional, knowledge, and dispositional variables, including age, gender, approximate IQ group, technology intervention group, the average numbers of completed WFA chapters, preintervention test score on *Self-Efficacy and Outcome Expectancy for Educational Planning*, and preintervention test score on WFA *Knowledge Test* (see Table 3).

Table 3. All Dependent Variables and Predictors Used for Data Analyses

Variable		Measure
Dependent variable	Self-determination[a]	Postintervention test scores on the *Arc's Self-Determination Scale* and the *AIR Self-Determination Scale*
	Transition planning knowledge[b]	Postintervention test scores on *Whose Future Is It Anyway?* Knowledge Test
Predictors: Personal variables	Age[a,b]	Reported by teacher
	Gender[a,b]	Reported by teacher
	Approximate IQ group[a,b]	Reported by teacher
Predictors: Instructional variables	*Rocket Reader* intervention group[a,b]	Group assignment (control or experimental group)
	# of *Whose Future Is It Anyway?* chapters completed by students[a,b]	Reported by teacher and/or students using *Teacher's/Student's Quick Survey*
Predictors: Dispositional variables	Self-efficacy[a,b]	Preintervention test score on *Self-Efficacy and Outcome Expectancy for Educational Planning*
	Outcome expectancy[a,b]	Preintervention test scores on the *Arc's Self-Determination Scale* and the *AIR Self-Determination Scale*
	2 self-determination scores[b]	
Predictor: Knowledge variable	Knowledge of transition planning[a]	Preintervention test score on *Whose Future Is It Anyway? Knowledge Test*

a. Variables used in multiple regression analysis with self-determination as a dependent variable.
b. Variables used in multiple regression analysis with transition planning knowledge as a dependent variable.

Separate regression analyses were conducted for each measure of self-determination. A standard multiple regression analysis was also conducted with transition planning knowledge as the dependent variable and nine predictors. The inclusion of the personal variables involved an effort to confirm previous research; the other variables were entered to explore their relationships. All analyses utilized the SPSS regression program. Table 3 shows each dependent variable and predictors used for analyzing data in this study and how each variable was measured. Prior to analysis, variables were examined through various SPSS programs for missing data (see above) and fit between their distributions and the assumptions of multivariate analysis. No cases were identified through Mahalanobis distance as multivariate outliers with $p < .001$. Therefore, 168 cases were used for analysis.

Results

Predictors of Self-Determination Measured by the Arc's Self-Determination Scale

Table 4 displays zero-order correlations between each predictor and dependent variable for the analysis with the SDS as the predictor variable, including the unstandardized regression coefficients (B), the standardized regression coefficients (β), the semipartial correlations (sr^2) and R^2, and adjusted R^2. R for regression was significantly different from zero, $F(8, 159) = 9.458$, $p < .001$. That is, the linear combination of predictors was significantly related to postintervention self-determination (a positive relation). For two regression coefficients, the self-efficacy score and WFA *Knowledge Test* score, that differed significantly from zero, 95% confidence limits were calculated. The confidence limits for self-efficacy were 0.2 to 1.366, and those for students' knowledge of transition planning process were 0.035 to 0.415. For one regression coefficient, average numbers of WFA chapters completed by students, which marginally differed from zero, 90% confidence limits were calculated. That is, students' self-efficacy and previous knowledge of transition planning meetings and their process significantly predicted postintervention self-determination, and self-efficacy was the best predictor of self-determination among all factors. Furthermore, how many WFA chapters students completed predicted students' postintervention self-determination. No other variables, including age, IQ group, gender, outcome expectancy, and technology use, predicted postintervention self-determination.

Only two of the predictive variables contributed significantly to prediction of students' self-determination: self-efficacy ($sr^2 = .043$) and knowledge of transition planning ($sr^2 = .023$). The eight factors in combination contributed another .25 (32% – 4.3% + 2.3%) in shared variability. Altogether, 32% (29% adjusted) of the variability in self-determination was predicted by the variability in these eight predictive variables.

Self-Determination Measured by AIR

Table 5 displays the zero-order correlations between each predictor and dependent variable with the AIR-S as the dependent variable, including the unstandardized regression coefficients (B), the standardized regression

Table 4. Standard Multiple Regression of Personal, Experiential or Instructional, Dispositional, and Knowledge Variables on Student's Self-Determination (Arc's Self-Determination Scale)

Variable	Zero-order correlation between each predictors and Arc's SD	*p*	*B*	β	sr^2 (unique)
Age	.089	.127	1.724	.069	.004
Gender	.153**	.024	2.597	.055	.003
Approximate IQ group	.085	.136	−0.155	−.005	.000
Self-efficacy	.513***	.000	1.101***	.331	.043
Outcome expectancy	.452***	.000	0.441	.130	.007
# completed WFA chapters	.212***	.003	1.255*	.122	.014
RR intervention	−.091	.121	−0.134	−.003	.000
WFA *Knowledge Test*	.306***	.000	0.225**	.172	.023
R^2	.32[a]				
Adjusted R^2	.29				
R	.57***				

RR = *Rocket Reader*; WFA = *Whose Future Is It Anyway?* Dependent variable = *the Arc's Self-Determination Scale* score. Gender: 1 = *male*, 2 = *female*; RR intervention: 1 = *no*, 2 = *yes*.
*$p < .10$. **$p < .05$. ***$p < .01$.
a. Unique variability = .07; shared variability = .25.

Table 5. Standard Multiple Regression of Personal, Experiential or Instructional, Dispositional, and Knowledge Variables on Student's Self-Determination (AIR Self-Determination Scale)

Variables	Zero-order correlation between each predictors and AIR SD	*p*	*B*	β	sr^2 (unique)
Age	.082	.144	0.894	.043	.002
Gender	.183**	.009	3.819	.097	.009
Approximate IQ group	.001	.492	1.643	.059	.003
Self-efficacy	.490	.000	0.597*	.216	.019
Outcome expectancy	.492**	.000	0.795**	.283	.033
# completed WFA chapters	.171*	.013	0.710	.083	.006
RR intervention	−.049	.264	0.086	.002	.000
WFA *Knowledge Test*	.233**	.001	0.121	.111	.010
R^2	.31[a]				
Adjusted R^2	.27				
R	.55**				

RR = *Rocket Reader*; WFA = *Whose Future Is It Anyway?* Dependent variable = *the Arc's Self-Determination Scale* score. Gender: 1 = *male*, 2 = *female*; RR intervention: 1 = *no*, 2 = *yes*.
a.Unique variability = .06; shared variability = .25.
*$p < .10$. **$p < .05$.

coefficients (β), the semipartial correlations (sr^2) and R^2, and adjusted R^2. *R* for regression was significantly different from zero, $F(8, 159) = 8.775$, $p < .001$. That is, the linear combination of predictors was significantly related to students' postintervention self-determination measured by the AIR-S (a positive relation). For the two regression coefficients, outcome expectancy and self-efficacy score, that differed significantly from zero, 95% confidence limits were calculated. The confidence limits for outcome expectancy were 0.23 to 1.171, and those for self-efficacy were 0.223 to 1.366. That is, students' self-efficacy and outcome expectancy significantly predicted postintervention self-determination, and outcome expectancy was the best predictor of self-determination among all predictors. Only two of all the factors contributed significantly to prediction of student's self-determination: outcome expectancy (sr^2 = .033) and self-efficacy (sr^2 = .019). However, another six factors did not uniquely contribute to prediction of students' self-determination. The eight factors in combination contributed another .25 in shared variability. Altogether, 30% (27% adjusted) of the variability in self-determination was predicted by variability in these eight factors.

Students' Understanding of Transition Planning

To determine which factors predicted postintervention knowledge of transition planning, a standard multiple regression was performed using students' postintervention understanding of transition planning as the dependent variable and intraindividual, instructional, and dispositional factors as predictor variables. For this analysis, the same intraindividual, instructional, and dispositional factors were used, except the WFA *Knowledge Test* was removed because of the link between this assessment and the intervention used (WFA), plus scores from the two self-determination measures were added, resulting in nine predictor variables (see Table 3).

Table 6 displays the zero-order correlations between each predictor and dependent variable, the unstandardized regression coefficients (*B*), the standardized regression coefficients (β), the semipartial correlations (sr^2) and R^2, and adjusted R^2. Based on *R* for regression, the linear combination of nine predictors was significantly related to students' knowledge of transition planning after student-directed transition planning instruction, $F(9, 158) = 8.26$, $p < .001$. For the two regression coefficients, approximate IQ group and numbers of WFA chapters students completed, that differed significantly from zero, 95% confidence limits were calculated. The confidence limits for students' approximate IQ group were 4.354 to 10.706, and those for numbers of WFA chapters students completed were –0.010 to 1.861. For one regression coefficient, students' preintervention self-determination score measured by the SDS, which marginally differed from zero, 90% confidence limits were calculated. That is, students' IQ group

Table 6. Standard Multiple Regression of Personal, Experiential or Instructional, Dispositional, and Knowledge Variables on Student's Transition Planning Knowledge

Predictors	Zero-order correlation between each predictors and DV	*p*	*B*	β	sr^2 (unique)
Age	−.105*	.087	−0.595	−.036	.001
Gender	.067	.194	1.262	.040	.001
Approximate IQ group	.401***	.000	7.575***	.337	.093
Self-efficacy	.370***	.000	0.302	.135	.006
Outcome expectancy	.349***	.000	0.362	.159	.010
# completed WFA chapters	.227***	.002	0.921**	.134	.016
RR intervention	−.199***	.005	−0.115	−.004	.000
AIR SD	.162**	.018	−0.053	−.065	.002
Arc's SD	.348***	.000	0.105*	.150	.013
R^2	.32[a]				
Adjusted R^2	.28				
R	.57***				

RR = *Rocket Reader*; WFA = *Whose Future Is It Anyway?* Dependent variable = *the Arc's Self-Determination Scale* score. Gender: 1 = *male*, 2 = *female*; RR intervention: 1 = *no*, 2 = *yes*.
a. Unique variability = .07; shared variability = .25.
*$p < .10$. **$p < .05$. ***$p < .01$.

and numbers of completed WFA chapters statistically significantly predicted postintervention transition planning knowledge. Moreover, students' self-determination scores, obtained prior to the student-directed transition planning instruction, could possibly predict students' postintervention transition planning knowledge. Only two of the independent variables contributed significantly to prediction of students' postintervention transition planning knowledge, IQ group ($sr^2 = .093$) and numbers of completed WFA chapters ($sr^2 = .016$). However, another seven factors did not uniquely contribute to prediction of students' postintervention transition planning knowledge. Altogether, 32% (28% adjusted) of the variability in postintervention transition planning knowledge was predicted by knowing values of these nine factors.

Discussion

Given the emphasis on promoting the self-determination of transition-age students with disabilities as a means to improve school and postschool outcomes, it is important to investigate and understand the relationship among self-determination and students' intraindividual, environmental, and instructional factors. The purpose of this study was to examine the contribution of student and contextual factors, including personal, experiential, and instructional factors, and knowledge and dispositional variables to students' self-reported levels of self-determination on two measures of self-determination and to examine the contribution of the same factors to postintervention transition knowledge and skills measured by a criterion-referenced assessment of knowledge presented in the WFA process.

Limitations of the Study

Before discussing our research findings, it is important to note the limitations of the study. First, the length of time during which the WFA intervention was implemented was not long enough to examine the potential impact of such instruction as a predictive variable. Teachers implemented about one third of the intervention over a 10-week period, and we would have expected stronger predictive effects from the intervention had the complete intervention been used. Second, because of the specific instructional support (e.g., computer-based reading support program) provided in this study, students with learning disabilities were dominant in the sample. Third, demographic and other data, particularly estimates of level of intelligence, relied on teacher report and cannot be considered as reliable as direct source data. Fourth, more psychometric data are needed about most of the measures, but particularly the self-efficacy and outcome expectancy measure. Although we believe these to be reliable and valid with the population with which they were used, and although data exist to support that belief, there is a clear need for better information about what each instrument is actually measuring and its reliability in doing so. Finally, this was, essentially, a convenience sample and may not be representative of this student population at large. These issues should be considered when interpreting the results from this study.

Predictors of Self-Determination

Findings showed that instructional, knowledge, and dispositional or belief factors predicted students' self-determination over personal predictor variables, such as age, gender, and IQ level. The multiple regression analysis examining contributors to the SDS scores found that of the eight predictor variables, three variables, including self-efficacy scores, student-directed transition planning instruction using WFA lessons, and students' preintervention transition planning knowledge, predicted higher self-determination scores. Moreover, the other multiple regression analysis examining contributors to the SDS scores found that only two dispositional variables, including self-efficacy and outcome expectancy, predicted students' postintervention self-determination scores.

The result of each multiple regression analysis indicated that self-efficacy (SDS) and outcome expectancy (AIR-S)

were the best predictors of students' self-determination. Self-efficacy was the only predictor variable that significantly predicted high self-determination scores on both measures of self-determination. The results also indicated that students' transition knowledge and skills predicted students' postintervention SDS score. This finding parallels those of several studies examining the transition planning process as a means to both teach and generalize skills related to self-determination and students' participation in transition planning (Test et al., 2004). Given the evidence that such instruction to promote student involvement in educational planning can lead to enhanced transition knowledge and skills (Cross et al., 1999; Wehmeyer & Lawrence, 1995; Zhang, 2001), these findings suggest that the benefit is reciprocal; that is, by promoting student involvement educators can enhance self-determination, and by promoting self-determination educators can promote student involvement in their planning.

We found that no personal variables (e.g., age, gender, IQ group) predicted students' postintervention self-determination. The relationships between self-determination and age and between self-determination and IQ were not significant and did not contribute to the regression equation after considering all other variables. However, the correlations between gender and the SDS score ($r = .153$) and between gender and the AIR-S score ($r = .183$) were consistent with correlations between self-determination and gender in other studies, including Shogren et al. (2007), which indicated that females showed a higher degree of self-determination than males.

Measuring Different Aspects of Self-Determination

As mentioned, self-efficacy and outcome expectancy predicted students' level of self-determination on the AIR-S as well as the SDS, but transition planning knowledge and transition planning instruction (WFA) predicted self-determination only on the SDS. A previous study indicated that there are differences in the aspects of self-determination measured on the SDS and the AIR scales (Shogren et al., 2008), and the current study and the Shogren et al. (2008) study suggest that each is measuring a different and, perhaps, unique aspect of the self-determination construct. Shogren and colleagues suggested that the skills and capacity being assessed by the SDS are *uncovering skills*, which could be more influenced by level of intelligence, and as a result the SDS is possibly more sensitive to detecting differences in intraindividual characteristics than the AIR-S. That transition planning knowledge, which has been shown to be closely related to self-determination, and the specific instruction promoting this knowledge were predictive of students' self-determination when being assessed by the SDS and not the AIR-S could be explained by the suggestions from Shogren et al. that different aspects of self-determination are being assessed by these two measures. In essence, that suggestion is that the SDS measures the present state of a person's self-determination whereas the AIR-S measures capacity and opportunity for becoming self-determined. Table 7 provides items illustrating those differences.

Table 7. Items From the Arc's Self-Determination Scale and the AIR Self-Determination Scale

Instrument	Item
Arc's SD scale	I plan weekend activities that I like to do
	I go to restaurants that I like
	I usually do what my friends want
	I can get what I want by working hard
AIR SD Student scale	People at school listen to me when I talk about what I want, what I need, or what I'm good at
	People at home let me know that I can set my own goals to get what I want or need
	People at home encourage me to start working on my plans right away

Predictors of Transition Planning Knowledge

Findings showed that students' estimated IQ group, number of student-directed transition planning instruction lessons completed, and students' level of self-determination as measured by the SDS were significant predictors of students' transition planning knowledge. The analysis indicated what would seem logical, that students who completed more lessons from the WFA curriculum were more likely to get higher scores on the transition planning knowledge test, which, if nothing else, serves as a means of construct validity for the curriculum itself.

Self-Determination Promoting Transition Planning Knowledge

In addition, the analysis examining contributors to transition planning knowledge indicated that students with higher self-determination scores as assessed by SDS were more likely to have higher transition planning knowledge test scores. This confirmed a previous study providing evidence of the importance of self-determination to the transition planning process for students with intellectual and developmental disabilities (Wehmeyer, Palmer, Soukup, Garner, & Lawrence, 2007). Moreover, student self-determination contributes to a student's knowledge and skills about transition planning, which are critical to successful student involvement, as discussed previously. At the same time, student involvement could be improved by promoting students' self-determination (Wehmeyer et al., 2003).

We also found that students in the estimated higher IQ group were more likely to have higher transition planning knowledge test scores after receiving transition planning instruction than were students in the estimated lower IQ group. As found in previous studies, a significant relationship between IQ scores and self-determination existed. Moreover, there was a statistically significant correlation between IQ and self-determination ($r = .133$), and it is consistent with other research studies. Also consistent with other studies, the strength of that correlation (.13) has limited practical significance, supporting the findings from Wehmeyer and Garner (2003) that although IQ status predicts self-determination status, it is not the most important factor in high self-determination.

The analysis examining contributors to transition knowledge scores found that neither self-efficacy nor outcome expectancy predicted transition knowledge score. Statistically significant correlations between self-efficacy and student's transition planning knowledge ($r = .370$) and that between outcome expectancy and student's transition planning knowledge ($r = 349$), however, were found. This result implies that self-efficacy and outcome expectancy, which is one aspect of self-determination capacity, should be considered as implementing instructions to enhance students' understanding of the transition planning process, and that could be strongly influential to students' active participation in transition planning and planning meeting.

In general, the study replicated findings pertaining to the relative contribution of intelligence to self-determination, added information about the potential contribution of self-efficacy and outcome expectancy, and pointed to the potential important role of relevant instructions promoting self-determination and transition planning knowledge, which possibly affect critical components of adult outcomes.

Implications for Practice

Perhaps the most important message from these data is that a student's self-determination is best predicted by factors that are not unchangeable, or nearly so, but by factors that can be affected by educators. In this study, student knowledge about transition, instruction, and self-efficacy and outcome expectations were the strongest predictors. This study confirms previous research showing a reciprocal benefit from student involvement on self-determination; by promoting one, educators can also promote the other. As importantly, this study mirrored findings from previous studies that IQ (or in this case, teacher estimates thereof) plays only a limited role in self-determination. As such, one implication for practice is that instruction to promote student involvement and other efforts that address student self-efficacy can be implemented to promote self-determination for all students. We would argue that promoting self-determination should become a "schoolwide" practice. A second implication is that the findings from this sample of younger students resembled those from similar studies of older students. Although this was not a longitudinal study and we did not collect data across school levels, it seems evident that many of the same factors are relevant to the younger population and that instruction, particularly perhaps in areas of student involvement, should begin during these earlier years. As noted in the introduction, there are multiple programmatic efforts, including the WFA process used in this study, to promote student involvement, and efforts to teach self-awareness and disability awareness, goal setting and attainment, problem-solving and decision-making skills, and self-advocacy skills in the context of promoting student involvement in educational planning can lead to enhanced self-determination and greater involvement.

Implications for Future Research

The findings of this study also have implications for future research. As discussed, self-determination promotes transition planning knowledge and vice versa. Moreover, these skills and capacities are closely related to critical components of successful transition to adulthood, such as students actively participating in transition planning meetings. As such, research identifying or examining effective strategies to promote both self-determination and student involvement in educational planning is needed. Future research should examine the relationships between specific student characteristics and dispositions, context, and intervention factors, as a means both to better understand predictors of self-determination and to provide a more finely tuned examination of interventions.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

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